| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/663,236 | 09/15/2003 | Eric J. Larsen | SONYP029 | 3753 |

25920        7590        03/03/2009
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| EXAMINER |
|---|
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| ART UNIT | PAPER NUMBER |
|---|---|
| 3714 | |

| MAIL DATE | DELIVERY MODE |
|---|---|
| 03/03/2009 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| | Application No. | Applicant(s) |
|---|---|---|
| **Office Action Summary** | 10/663,236 | LARSEN ET AL. |
| | Examiner | Art Unit | |
| | EMMANUEL OMOTOSHO | 3714 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1)☒ Responsive to communication(s) filed on *14 November 2008*.

2a)☒ This action is **FINAL**.            2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

4)☒ Claim(s) *1,4-19,21 and 46-50* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-19,21 and 46-50* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

## Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

# DETAILED ACTION

## *Claim Rejections - 35 USC § 112*

1.      The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

2.      Claims 1,4-13 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention.  The current claim language calls for a "gaze

projection of a position of the head through outer edges of the virtual window".  It is not

clear what the applicant is trying to say with this limitation.

## *Claim Rejections - 35 USC § 103*

3.      The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

4.      The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1.     Determining the scope and contents of the prior art.
2.     Ascertaining the differences between the prior art and the claims at issue.
3.     Resolving the level of ordinary skill in the pertinent art.
4.     Considering objective evidence present in the application indicating
       obviousness or nonobviousness.

5.      Claims 1, 4-19, 21 and 46-57 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Kang US Patent 6,009,210 and further in view of Kanade et al. US

Patent 6,151,009.

6.      Kang teaches a method for processing interactive user control for a view of a

scene displayed on a virtual window comprising:

7.      In regards to claims 1,14,46,47,52,53,57

        a.      Identifying a head of a user that is to interact with the scene (Col 1 lines

        43-47 and Col 3 lines 29-32)

        b.      Storing an initial frame of image data representing the head of the user

        (Col 3 lines 29-35)

        c.      Tracking the identified head of the user during display of the scene, the

        tracking enabling detection of a change in position of the head of the user

        (Abstract)

        d.      Tracking including identifying a search region within a frame of the user

        image data and comparing values within the search region to template values of

        the initial frame of the stored image data; adjusting a view frustum (which is

        being interpreted as the "view of the user into the virtual world") **in accordance**

        **with the change in position of the head of the user** (Col 2 lines 34-43 and Col

        3 lines 4-21)

        e.      Repeating the identifying the search region, the comparing, and adjusting

        for successive frames of the scene, wherein the comparing is performed with the

        initial frame of the stored image data (Col 2 lines 34-43 and Col 9 lines 17-44)

    f.      A computing device and a display screen in communication with the

    computing device configured to display image data defined through a view-

    frustum (Fig 1)

    g.      Tracking device is a camera (Fig 1)

8.      In regards to claim 15, a view frustum initially defined by a gaze projection set

between outer edges of a virtual window and a virtual position of the head when the

virtual position of the head is normal to a center point of the virtual window (Figs 1-3)

9.      In regards to claim 16 adjusting the view-frustum moves the virtual position of the

head away from normal relative to the center point of the virtual window (Col 2 lines 34-

43)

10.     In regards to claim 4,17, virtual position of the head being away from normal

relative to the center point of the virtual window changes an angle of the gaze

projection, the change in angle of the gaze projection displays a change in viewing

angle of the scene provided by the video clip (Col 4 line 60- Col 5 line 49)

11.     In regards to claim 5, the change in viewing angle of the scene is a result of the

detected movement of the head of the user to enable the interaction with the scene (Col

4 line 60- Col 5 line 49)

12.     In regards to claim 1,6-7,14,46,49,50 Kang fail to specifically teach

    h.      Adjusting a scale of the scene according to a change in a distance of the

    head of the user from a capture device

    i.      Using a capture device having depth-capturing capability.

13.    Kanade teaches the use of a depth capturing camera for interaction with a view

of a scene (abstract)

14.    One of ordinary skill in the art, at the time of the invention, would have been

motivated to have a system that interacts with a view of a scene using depth capturing

device to adjust a scale of the scene according to a change in a distance of the head of

the user from the capture device.  Using a depth camera, the system would be able to

        j.        Obtain distance or depth information from the object being tracked

        (inherent of "depth camera)

        k.        Determine any interaction such as occluding, shadowing, reflecting or

        colliding (Kanade abstract)

        l.        Generate appropriate output based on said determination (Kanade

        abstract)

15.    **In regards to limitations that further defined and claimed the definition of**

**the view frustum defined by a gaze projection of a position of the head through**

**outer edges of the virtual window when the position of the head is substantially**

**normal to about a center point of the virtual window.  Applicant should**

**respectfully note that this is the known view projection associated with depth**

**cameras.  Depth cameras acquire and process recieved image data by performing**

**a coordinate transformation on each recieved pixel.  The depth information is**

**processed by reading the objects current location in reference to the windows**

**center point (i.e. the need for calibration and storing initial image) and**

**transforming the received location to an (x,y,z) coordinates.  Where x and y**

corresponds to a position that relates to a position on the display screen and z

corresponds to the distance from the position to camera. Hence the projection.

A constant focus on the object has to be maintained throughout the process for

the system to be able to maintain the correct coordinates.

16.     Wherein the adjusted view frustum defined by an updated gaze projection

of the changed position of the head through the outer edges of the virtual window

((Col 2 lines 34-43 and Col 3 lines 4-21), examiner interprets this limitation as, 'as the

user moves his/her head, the view frustum is changed to reflect said change'). In

regards to laterally adjusting the view frustum in a direction opposite to the

change in position of the head of the user (see cols 3-4 of Kang), applicant should

respectfully note that the location of the user's head and the location of the view

frustum are opposite each other (i.e. the user is facing the view). Thus, they have

different orientation (i.e. the user's left is the view frustum's right). Furthermore,

the examiner interprets this limitation as ' as the user moves his/her head, the

view frustum is changed to reflect said change '. For example, if the user moves

his/her head to the left, the vertex of rotational angle (i.e. the viewpoint around

the viewing axis) will need to shift to the right (in respect of the user) to show the

scene on the left of the user. Similar to if a person wants to move his/her head to

see what is on the left, the back of the person's head has to move to the right

while the persons view moves to the left to see what is on the left

17.     In regards to claim 8, the initial frame of image data is marker-less (Fig 1)

18.    In regards to claim 9, the initial frame of data is maintained throughout the video

clip (Fig 1)

19.    In regards to claim 10,48, the video clip is of a video game.  Although Kang

teaches the method to be generally associated with virtual environment in computer

systems, Kang further teaches that video games are well known in the art as virtual

environment in a computer system (Col 1 lines 26-40)

20.    In regards to claim 11, the interaction with the scene by tracking movement of the

head of the user is independent of user hand-held controls for interacting with the video

game (Col 1 lines 5-9)

21.    In regards to claim 12, the method operation of tracking the identified head of the

user during display of the video clip includes tracking a facial portion of the head and

matching gray scale image data associated with the facial portion to image associated

with a template of the facial portion (Col 9 lines 20-33)

22.    In regards to claim 13,18-19,50, the method of adjusting a view frustum in

accordance with the change in position of the head of the user includes identifying a

point of interest of the scene of the video clip and modifying the view-frustum so that the

point of interest appears at a constant position when displayed in successive video clips

(Kang Claim 6).  The Examiner should point out that each frame in Kang's disclosure

has to be scanned before the scene transformation could occur.

23.    In regards to claim 21,49-50, the method operation of translating a view frustum

in accordance with the change in position of the head of the user includes rotating the

view-frustum about the head of a user according to the change in position of the head of

the user (Kang Claim 5).

### *Response to Arguments*

24.    Applicant's arguments filed 7/16/07 with respect to claims 1-26,28-44 and 46-57

have been considered but are moot in view of the new ground(s) of rejection.

### *Response to Arguments*

25.    Applicant's arguments filed 12/04/07 have been fully considered but they are not

persuasive.

26.    On page 20, applicant argues, "Further, Kang would not adjust a scale of the

scene according to a change in a distance of the head of the user from a capture device

as specified in claims I, 14, 22, 28, 33, 39, 46 and 52, or include a camera having depth

capability as specified in claims 7 and 31, since the change in relative object depth

compared to the distance to the camera must be small under the affine model (see

column 5 lines 58-63). For the affine model to work, it is required that the surface

appear planar. In order for the face to appear planar, the distance from the user to the

camera must be relatively large. The use of a depth camera would render moot the

entire affine model principles for which Kang is constructed"

27.    The examiner respectfully disagrees. Kang's invention is directed to 2-D affine

"transformation". Kang teaches that the technique is suitable for planar surfaces with

an affine camera model especially when the user is far from the camera. Therefore, a

depth camera would not render moot Kang's affine model technique. Please see Col

6:44-60 of Kang.

28.     On page 21, applicant argues, "The Examiner indicates that the teachings of

Kanade would motivate one skilled in the art to interact with a view of a scene using

depth capturing to adjust a scale of the scene according to a change in distance of the

head of the user. Although Kanade teaches the identification of depth, the depth is only

needed to capture the user, who needs to stand in from of a backdrop. These teachings

do not teach to adjust the scale of the scene. In fact, the position of the user's head is in

no way tied to any adjustment in a scene. The only distance tracking done is to identify

where the user is located, so that objects can be positioned in and around the scene.

As a further distinction, the "scene", as claimed is different from the area captured by

Kanade. Specifically, in the claimed invention, the view-frustum is adjusted in

accordance with the change in position of the head of the user and the adjusting of a

scale of the scene takes placed according to a change in a distance of the head of the

user from a capture device. In Kanade, the user is "in the scene". That is, the user is

captured, and then injected into the scene. What the user does in the scene in no way

performs adjustments. Indeed, if the user moves his head, the scene is not adjusted."

29.     However, Kanade is not being relied upon for the teaching of adjusting the scale

of the scene.  As shown above, Kang teaches adjusting the scale of the scene based on

user location information received from a camera. Kanade is being used to show that

using depth capturing image to capture depth information of a user during a gaming

session is old in the art (Kanade abstract).

### *Response to Arguments*

30.     Applicant's amendments/arguments filed 4/28/08 have been fully considered.

Please see paragraph 13 above which addresses the newly added limitations.

### *Response to Arguments*

31.     Applicant's arguments filed 11/14/08 have been fully considered but they are not

persuasive.

32.     On pages 11-12, applicant argues, "The first method taught is "to directly use the

pose parameters to determine the absolute position and orientation of the viewpoint"

(Col. 8, lines 27-29). In other words, movement of a user's head in a given direction

produces movement of the view of the virtual reality environment in the same direction.

The second method taught applies the same directional system, but incorporates

incremental control to "indicate continuous movement within the virtual reality

environment" (Col. 8, lines 32-40). In contrast to Kang, Applicants' claim 1 is directed

towards a view of a scene comprising a view-frustum defined with reference to a gaze

projection of a position of the head of the user through the outer edges of a virtual

window. The volumetric virtual space beyond the virtual window which is delimited by

the gaze projection through the outer edges defines the view-frustum. And as the user's

head moves, the view-frustum is adjusted accordingly, such that the gaze projection

through the virtual window is updated in light of the changed position of the user's head

to determine the new view-frustum. Thus, in contrast to the direct use of pose

parameters to determine viewpoint disclosed by Kang, Applicants' claim 1 utilizes an

indirect method wherein the view of the scene is defined with reference to a virtual

window. Hence, a movement of a user's head in a lateral direction will have the perceptual effect of shifting the view of the scene in the opposite direction. Kang does not disclose a view-frustum defined with reference to a virtual window, nor the adjustment of such a view-frustum in the manner claimed."

33.    The examiner respectfully disagrees. In Kang's invention, the player is looking at the virtual reality through an angled view (i.e. the angle about the viewing axis). As the player's head changes in position, the vertex of said angle will need to move in an opposite direction in order to move the scene in the same direction that the head is moving. This is not different from applicants claimed invention.

### *Conclusion*

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to EMMANUEL OMOTOSHO whose telephone number is

(571)272-3106. The examiner can normally be reached on m-f 10-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Peter Vo can be reached on (571) 272-4690. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

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USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

EO

/Ronald  Laneau/
Primary Examiner, Art Unit 3714
02/27/09